**I CLAIM AS MY INVENTION:**

1. A method to process measurement data comprised of a plurality of data sets with a plurality of independent random samples originating via temporally successive measurements comprising the steps of:

for each independent random sample in the data set, comparing a measured time curve arising from measurement data x of the random sample, using the general linear model, with a time curve of at least one model function of a model matrix G, to test for incidence of specific characteristics in the measured time curve;

implementing individual calculations for the comparison from the measurement data in a sequence of the of the data sets, or volume data sets originating from the time sequence of the measurements, for all relevant measurement data of a volume data set and storing said calculations as intermediate results;

updating the intermediate results from a directly preceding volume data set with new calculations, such that at any time intermediate results can be calculated, and after a one-time cycle of all volume data sets an end result exists from which an assertion about the incidence of the characteristics in the signal curve is derived; and

obtaining the square of an error vector for the intermediate or end result from a difference of the square of a measurement value vector formed from the measurement data and the square of a model vector calculated from the model function.

2. A method as claimed in claim 1 comprising calculating, in the cycle of the data sets, for each data set m and each random sample, vector elements

$$GTx_i = GTx_i^{old} + G_{m,i} \cdot G_{m,k}$$

and the square of the measurement value vector

$$XX = XX^{old} + (x_m)^2$$

from the calculated vector elements $GTx_i^{old}$ and the square of the vector $XX^{old}$ of the directly preceding data set, and for the subsequent data set and storing said squares as an intermediate result,

whereby m = 0 .. max-1, i = 0 .. sp-1, k = 0 .. sp-1, sp corresponds to of the number of the columns of the model matrix G, and max corresponds to the total number of the data sets,

and whereby subsequently the square of the model vector

$$MM = MM^{old} + GTG_{j,k} \cdot b_j \cdot b_k$$

and the value of the square of the error vector

$$EE = XX - MM$$

are calculated, whereby j = 0 .. sp-1 and $b_j$, $b_k$ are vector elements of the vector $b = GTG^{-1} \cdot GTx$ that are calculated in an intermediate step.

3. A method as claimed in claim 2, comprising calculating in the cycle of the data sets, furthermore for each data set m the matrix elements

$$GTG_{i,k} = GTG_{i,k}^{old} + G_{m,i} \cdot G_{m,k}$$

from the calculated vector elements $GTG_{i,k}^{old}$ of the directly preceding data set, and for the subsequent data set are stored as an intermediate result.

4. A method as claimed in claim 2, comprising before or after the cycle of the data sets, calculating the matrix elements $GTG_{i,k}$ from the model matrix G in a step.

5. A method as claimed in claim 2 comprising, after an end of the cycle, calculating a t-value from the calculated values for each random sample.

6. A method as claimed in claim 1 comprising for said calculations, loading only one data set is loaded into a working storage of a data processing system, and after the calculations discarding the loaded data set.

7. A method as claimed in claim 1 comprising cycling the data sets in parallel with the measurements.

8. A method as claimed in claim 7, comprising interrupting the cycle of the data sets after a predeterminable number of measurements, and present a current result of the measurements, and after this interruption continuing the cycle.

9. A method as claimed in claim 1 comprising acquiring said data sets from a subject volume by functional imaging, with the data sets originating from

temporally successive measurements representing volume data sets, and with the time curve for an independent random sample comprised in the data set corresponding to the temporal signal curve of a volume element acquired in the subject volume.

10. A data acquisition and processing arrangement comprising:

a data acquisition device that obtains a plurality of data sets with a plurality of random samples originating in temporally successive measurements; and

a processor and a working memory connected to said processor for processing said data sets by, for each independent random sample in the data set, comparing a measured time curve arising from measurement data x of the random sample, using the general linear model, with a time curve of at least one model function of a model matrix G, to test for incidence of specific characteristics in the measured time curve, implementing individual calculations for the comparison from the measurement data in a sequence of the of the data sets, or volume data sets originating from the time sequence of the measurements, for all relevant measurement data of a volume data set and storing said calculations as intermediate results, updating the intermediate results from a directly preceding volume data set with new calculations, such that at any time intermediate results can be calculated, and after a one-time cycle of all volume data sets an end result exists from which an assertion about the incidence of the characteristics in the signal curve is derived, and obtaining the square of an error vector for the intermediate or end result from a difference of

the square of a measurement value vector formed from the measurement data and the square of a model vector calculated from the model function.

11. A device as claimed in claim 10 wherein said data acquisition device is a magnetic resonance system.

12. A device as claimed in claim 11 wherein said data acquisition device is a functional magnetic resonance system.